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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,489	11/30/2001	Matt Hayek	CS11336	6375

20280 7590 05/18/2004

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EXAMINER	
PEREZ GUTIERREZ, RAFAEL	
ART UNIT	**PAPER NUMBER**
2686	7

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,489	Hayek et al.	
	Examiner	Art Unit	
	Rafael Perez-Gutierrez	2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10* is/are allowed.

6)☒ Claim(s) *11 and 13-25* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Action is in response to Applicant's response under 37 C.F.R. 1.111 filed on December 23, 2003. **Claims 1-25** are still pending in the present application. **This Action is made FINAL.**

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly Indicative of the invention to which the claims are directed. The following title is suggested: -- **METHODS FOR PROCESSING AN RF SIGNAL IN VERY LOW INTERMEDIATE FREQUENCY AND DIRECT CONVERSION RECEIVERS**--.

Acknowledgement is made of the acceptance of the above-suggested title by the Applicant, however, the suggested title needs to be specified in an amendment reply by the Applicant. Therefore, the Examiner encourages the Applicant to submit an amendment to the title, adopting the above-suggested title, in reply to the present Office Action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior

> art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 11, 13, 14, 18, and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)**, as applied in the previous Office Action.

Consider **claims 11 and 24**, Atkinson clearly shows and discloses a method in intermediate frequency and direct conversion receivers, comprising:

receiving a signal (figure 2 and page 2 paragraph 0017); and

providing a local oscillator signal 34 (mixer injection frequency) (figure 2) at a frequency (i.e., 1.35 GHz) different than the received frequency (1.8 GHz) by dividing a voltage controlled oscillator (VCO) 38 output by a frequency divide ratio (figure 2 and page 2 paragraphs 0018 and 0019),

the VCO 38 having a frequency F_3 outside received signal harmonics (figure 2 and page 2 paragraph 0020).

Although Atkinson does not specifically disclose that the frequency F_3 is also outside a bandwidth of received signal harmonics, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a frequency F_3 that is outside of a bandwidth of received signal harmonics in order to further minimized any effect in VCO 38 from a potential coupling of the received signal (Atkinson; page 2 paragraph 0020).

Consider **claim 13, 14, and 18**, and **as applied to claim 11 above**, although Atkinson does not specifically discloses that the frequency divide ratio is greater or equal to one, Atkinson does discloses that the frequency divide ratio can be selected such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of the received signal (e.g., outside a channel bandwidth) or a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal (page 2 paragraphs 0019 and 0020).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Atkinson to specifically select a frequency

divide ratio greater or equal to one that would have maintained the local oscillator frequency outside the bandwidth of harmonics or fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency.

5. **Claims 15-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)** in view of **Freed (U.S. Patent # 6,487,419)**, both as applied in the previous Office Action.

Consider **claims 15-17**, and **as applied to claim 11 above**, Atkinson clearly discloses the claimed invention except the steps of determining the signal strength and bit error rate (BER) of the received signal and increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold.

Freed clearly discloses the steps of determining the signal strength of a received signal at a wireless device and increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold (abstract and column 2 line 20 - column 3 line 26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Atkinson with the teachings of Freed to determined the signal strength of the received signal and allow the control of the gain of the received signal if the gain of the received signal is below a gain threshold in order to efficiently manage the power consumption of the wireless device.

6. **Claims 19 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Arpaia et al. (U.S. Patent # 6,192,225 B1), as applied in the previous Office Action.

Consider **claims 19 and 25**, Arpaia et al. clearly show and disclose a method in an RF receiver, comprising:

receiving a signal within a passband of a preselector filter 1 of the receiver (figure 2, column 3 lines 20-25 and column 4 lines 1-6);

mixing the received signal at a local oscillator (mixer injection) frequency f_0 outside the passband of the preselector filter 1 (figure 2, column 4 lines 47-50, and column 4 line 58 - column 5 line 3);

chopping the received signal after mixing at a chopper frequency, the chopper frequency proportional to the local oscillator (mixer injection) frequency f_0 (figure 2 and column 4 line 1 - column 5 line 16).

Although Arpaia et al. do not disclose chopping the signal before mixing, since Arpaia et al., also disclose that the received signal is not affected by phase change element 5 and inverters 9, 9' 9 (choppers), therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Arpaia et al. to also chop the received signal before mixing in order to improve the elimination of second-order products of the received signal.

7. **Claims 20 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al. (U.S. Patent # 6,192,225 B1)** in view of **Freed (U.S. Patent # 6,487,419)**, both as applied in the previous Office Action.

Consider **claims 20 and 21**, and **as applied to claim 19 above**, Arpaia et al. clearly disclose the claimed invention except the steps of increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, mixing the received signal at a local oscillator frequency outside the passband of the preselector filter when the gain is above a threshold and within the passband when the gain is below a threshold.

Freed clearly discloses the steps of determining the gain of a received signal at a wireless device, increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold, and mixing the received signal at a local oscillator frequency outside the passband of the preselector filter when the gain is above a threshold and within the passband when the gain is below a threshold (abstract and column 2 line 20 - column 3 line 26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Arpaia et al. with the teachings of Freed to determined the gain of the received signal and allow the control of the gain of the received signal if the gain of the received signal is below a gain threshold in order to efficiently manage the power consumption of the wireless device.

8. **Claims 22 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Arpaia et al. (U.S. Patent # 6,192,225 B1)** in view of **Atkinson (U.S. Patent Application Publication # 2001/0039182 A1)**, both as applied in the previous Office Action.

Consider **claims 22 and 23**, and **as applied to claim 19 above**, Arpaia et al. clearly disclose the claimed invention except that the local oscillator frequency is derived from a VCO

frequency outside a bandwidth of received signal harmonics, the VCO frequency provided by dividing the VCO output by a frequency divide ratio that corresponds to the harmonic of the received signal.

Atkinson clearly shows and discloses a method in intermediate frequency and direct conversion receivers comprising, among other steps, the step of providing a local oscillator signal 24 (mixer injection frequency) (figure 2) by dividing a voltage controlled oscillator (VCO) 38 output by a frequency divide ratio (figure 2 and page 2 paragraphs 0018 and 0019), the VCO 38 having a frequency F_3 outside a bandwidth of received signal harmonics (figure 2 and page 2 paragraph 0020), and the local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal (page 2 paragraphs 0019 and 0020).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings Arpaia et al. with the teachings of Atkinson to specifically select a frequency divide ratio greater or equal to one that would have maintained the local oscillator frequency outside the bandwidth of harmonics or fundamental frequency of the received signal in order to prevent leakage of the local oscillator frequency.

Allowable Subject Matter

9. **Claims 1-10** are allowed.

10. **Claims 12** is objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The Examiner's statement of reasons for allowance can be found in the first Office Action mailed on March 13, 2003.

Response to Arguments

12. Applicant's arguments filed on December 23, 2003 have been fully considered but they are not persuasive.

In the present application, Applicant argues, in relation to **claim 11** on page 3 of the remarks, that Atkinson does not disclose or suggest that the voltage controlled oscillator has a frequency outside a bandwidth of received signal harmonics.

The Examiner respectfully disagrees with Applicant's argument because Atkinson does suggest to a person of ordinary skill in the art that the frequency of the VCO 38 can be outside a bandwidth of received signal harmonics when he discloses that the frequency of the VCO **is not harmonically related** to the input RF signal (i.e., received signal) in order to minimize any effect in VCO 38 from a potential coupling of the received signal (paragraph 0020) (emphasis added). It becomes clears from this teaching that received signal harmonics in the bandwidth of the input RF signal would interfere with the operation of VCO 38.

Regarding **claims 13, 14, and 18**, Applicant argues, on pages 4 and 5 of the remarks, that

certain limitations (i.e., the frequency divide ratio q being greater or equal than one) recited in the above-mentioned claims are not taught by Atkinson.

However, the Examiner respectfully disagrees with Applicant's argument because Atkinson's disclosure clearly suggest to one of ordinary skill in the art to select the frequency divide ratio such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of the received signal (e.g., outside a channel bandwidth) or a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal (see page 2 paragraphs 0019 and 0020).

Regarding **claims 15-17**, Applicant argues, on pages 6 and 7 of the remarks, that certain limitations (i.e., determining the signal strength of a received signal at a wireless device and increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold) recited in the above-mentioned claims are not taught by Atkinson in view of Freed.

However, the Examiner respectfully disagrees with Applicant's argument because Freed clearly discloses the limitations argued by the Applicant in the abstract and in column 2 line 20 - column 3 line 26. For example, Freed clearly discloses in such citations the steps of determining the signal strength of a received signal at a wireless device and increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold.

Regarding **claims 19 and 25**, Applicant argues, on pages 7-9 of the remarks, that Arpaia et al. do not teach mixing the received signal a mixer injection frequency outside the passband of the pre-selection filter.

The Examiner respectfully disagrees with Applicant's argument because Arpaia et al. clearly disclose in column 4 line 47 - column 5 line 3 that the mixer injection frequency, by means of the switching oscillator, is outside of the passband of the pre-selection filter.

Regarding **claims 20 and 21**, Applicant argues, on pages 9 and 10 of the remarks, that certain limitations recited in the above-mentioned claims are not taught by Arpaia et al. in view of Freed.

However, the Examiner respectfully disagrees with Applicant's argument because Freed clearly discloses the limitations argued by the Applicant in the abstract and in column 2 line 20 - column 3 line 26. For example, Freed clearly discloses in such citations the steps of determining the signal strength of a received signal at a wireless device and increasing a gain of the received signal before mixing if the gain of the received signal is below a gain threshold.

Regarding **claims 22 and 23**, Applicant argues, on pages 10-12 of the remarks, that certain limitations (i.e., the frequency divide ratio q being greater or equal than one) recited in the above-mentioned claims are not taught by Arpaia et al. in view of Atkinson.

However, the Examiner respectfully disagrees with Applicant's argument because Atkinson's disclosure clearly suggest to one of ordinary skill in the art to select the frequency divide ratio such that the received signal is mixed at a local oscillator frequency outside a bandwidth of a fundamental frequency of the received signal (e.g., outside a channel bandwidth) or a local oscillator frequency derived from a VCO frequency that is outside a bandwidth of the nth harmonic of the received signal (see page 2 paragraphs 0019 and 0020).

Consequently, and in view of the above reasons and having addressed each of

Applicant's arguments, the previous rejection is maintained and made FINAL by the Examiner.

Conclusion

13. **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any response to this Office Action should be **faxed to** (703) 872-9306 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Crystal Park II

2021 Crystal Drive
Arlington, VA 22202
Sixth Floor (Receptionist)

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Rafael Perez-Gutierrez whose telephone number is (703) 308-8996. The Examiner can normally be reached on Monday-Thursday from 6:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marsha D. Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700 or call customer service at (703) 306-0377.

Rafael Perez-Gutierrez
R.P.G./rpg

RAFAEL PEREZ-GUTIERREZ
PATENT EXAMINER

May 7, 2004